

# NAS NORTH ISLAND - NAVY REGION SOUTHWEST NAVY ENVIRONMENTAL LEADERSHIP PROGRAM

## CLEANUP

### SITE CHARACTERIZATION AND ANALYSIS PENETROMETER SYSTEM (SCAPS) FOR PETROLEUM, METALS, AND CHLORINATED SOLVENTS

#### LEAD ACTIVITY

Naval Air Station (NAS) North Island

#### STATUS

Active

#### MISSION

Rapid field screening and delineation of subsurface contamination

#### REQUIREMENT

As part of the Navy's efforts to develop methods to characterize contaminated sites faster, better, and more cost effectively, the Site Characterization and Analysis Penetrometer System (SCAPS) has been developed by the Navy to delineate petroleum-contaminated sites on Navy bases throughout the United States.

#### DESCRIPTION

The Space and Naval Warfare (SPAWAR) Systems Center, formerly the Naval Command, Control, and Ocean Surveillance Center Research, Development, Test, and Evaluation Division has developed a fiber-optic sensor apparatus integrated with a cone penetrometer called SCAPS. SCAPS, equipped with a laser-induced fluorescence (LIF) sensor, is capable of real-time, in situ measurement of petroleum products. SPAWAR Systems Center demonstrations at NAS North Island and other sites have successfully



**SCAPS Rig**

correlated SCAPS LIF data with conventional soil sampling and laboratory analysis from confirmation soil borings. SCAPS was successfully used to delineate soil contamination for an expedited underground storage tank (UST) closure at NAS North Island. SCAPS is now in operational use by PWC San Diego for site assessment of petroleum contaminated sites. SPAWAR Systems Center has also conducted initial field trials of its Raman Spectroscopy chlorinated solvent detection system at the NAS North Island Fuel

Farm and Site 9. SPAWAR Systems Center has also developed other new sensors that will detect metals and nonaqueous phase liquids (NAPL). A preliminary field test using the new Surface Enhanced Raman sensor was conducted at Site 9.

### **BENEFITS**

- Savings of more than 30 percent will be realized on the traditional cost of site assessments
- The SCAPS LIF petroleum sensor provides real time, in situ data, with a vertical resolution of 2 inches, without generating drill cutting

### **ACCOMPLISHMENTS/CURRENT STATUS**

<b>Date</b>	<b>Activity</b>
JUL 1993	SCAPS equipped with LIF was used at various NAS North Island locations through 1995 to develop petroleum characterization technology; Project completed, technology exported
JUL 1995	NCCOSC RDT&E Division began initial tests of the Raman Spectroscopy chlorinated solvent detection system at Site 9
JUL 1997	Testing conducted using the Surface Enhanced Raman Sensor
SEP 1997	Prepared summary report

### **FUTURE PLAN OF ACTION & MILESTONES**

<b>Date</b>	<b>Activity</b>
Continuous	Continue use of SCAPS for site assessment of petroleum contaminated sites

### **COLLABORATION/TECHNOLOGY TRANSFER**

The SCAPS project is a collaborative effort among SPAWAR Systems Center, Tetra Tech EM Inc. (Tetra Tech) and NAS North Island. SPAWAR Systems Center developed SCAPS and Tetra Tech acted as the site manager for the projects conducted at NAS North Island. SCAPS is now in operational use by PWC San Diego for site assessment of petroleum contaminated sites.

### **BIBLIOGRAPHY**

- Tetra Tech EM Inc. (formerly PRC Environmental Management, Inc.) Proposed Work Plan SCAPS Project, NAS North Island. July 1994.
- Tetra Tech EM Inc. (formerly PRC Environmental Management, Inc.) Assessment/Migration Report for Building 489, Tank 489, NAS North Island. January 1995.
- U.S. Environmental Protection Agency. The Site Characterization and Analysis Penetrometer System (SCAPS) Laser-Induced Fluorescence (LIF) Sensor and Support System, Innovative Technology Evaluation Report. February 1996.

- State of California, Office of Administrative Law, Department of Toxic Substance Control, Final Notice of Certification, Final Decision to Certify Hazardous Waste Environmental Technology. California Regulatory Notice Register, Register 96, No. 27-Z. July 1996.

#### **RELATED GOVERNMENT INTERNET SITES**

[SPAWAR -SCAPS-LIF System Technology – Programs and Projects:](#)

#### **RELATED NAVY GUIDEBOOK REQUIREMENT**

- 07003 UST Remedial Investigation

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